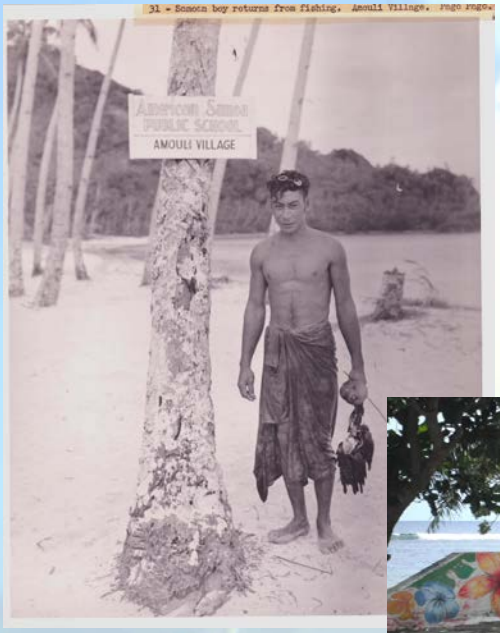
Climate Resiliency Responses and Actions



For Amouli Village, American Samoa

Prepared by the Amouli Resiliency Planning Committee in collaboration with the NOAA Fisheries-Pacific Island Regional Office
(Funded by NOAA Fisheries-Coral Reef Conservation Program)

2012-2015

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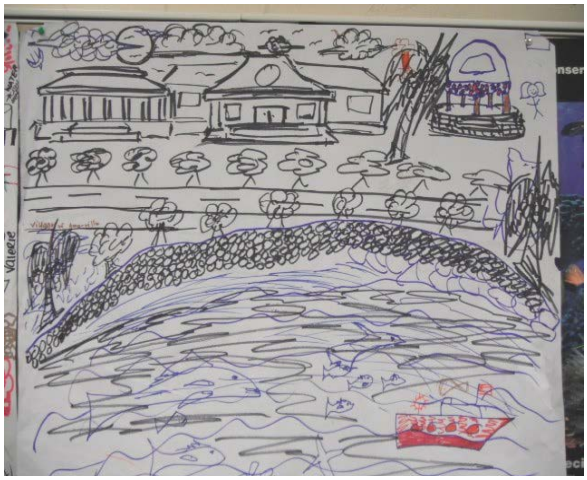
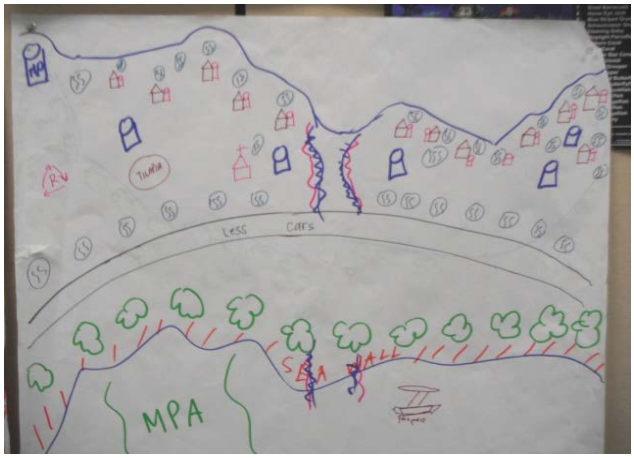
ACRONYMS

ASCC	American Samoa Community College
AS-EPA	American Samoa Environment Protection Agency
ASPA	American Samoa Power Authority
CRAG	Coral Reef Advisory Group
DMWR	Department of Marine and Wildlife Resources
DOC	Department of Commerce
DPS	Department of Public Safety
NOAA	National Oceanic Atmospheric Administration
OSA	Office of Samoan Affairs
PIRO	Pacific Island Regional Office
PLA	Participatory Learning and Action
UH	University of Hawaii
USDA	United States Department of Agriculture

VISION FOR AMOULI RESILIENCY TOWARDS CLIMATE CHANGE IMPACTS





These are some of the drawings from the PLA community workshop using the Vision Tool that village participants utilized to envision how they would like to perceive Amouli village as a resilient community towards potential climate change impacts. From collective drawings and discussions with participants, the shared community vision was identified as the Amouli vision statement for this plan.

AMOULI VISION STATEMENT

"Amouli village is a climate-resilient community that is well prepared to adapt and cope with potential changes and impacts due to climate change. Amouli collaborates well with government agencies, non-governmental organizations, and other communities to mitigate climate change and preserve culture, religion, and natural resources for future generations of Amouli."

INTRODUCTION

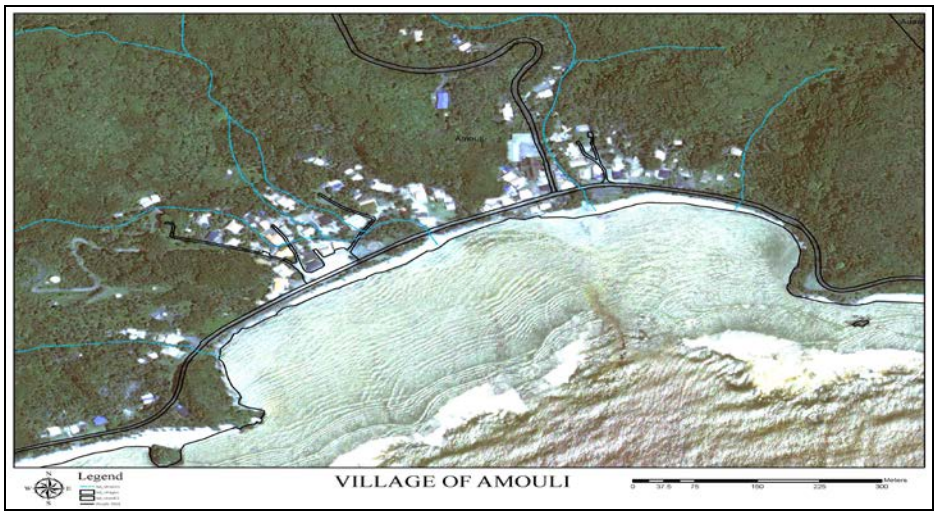
Global climate change is acknowledged as the greatest environmental concern of our time. Human activities have affected the land, oceans, and atmosphere, and these changes in turn have altered global climate patterns. Over the 20th century, the Earth's global average surface temperature has risen significantly, with projected continued increases affecting the environment as well as human livelihoods. Expected global climate impacts include: (1) an increase in the frequency of extreme weather events, (2) changes in precipitation patterns, (3) changes in sea-level rise, (4) changes in ocean temperatures, and (5) increased ocean acidification.

Coastal communities are particularly vulnerable to climate change due to their proximity to and reliance on the ocean. In order to better prepare for potential climate impacts, communities must work to be resilient to the impacts derived from climate change. A climate resilient community can cope with and recover quickly from difficult conditions caused by the adverse effects of climate change, including climate related hazards and disasters (UNDP 2008). In order to be more resilient to climate impacts, a community can participate in advance planning for climate change, work to prevent predicted impacts when possible, and try to adapt and mitigate to climate change impacts.

PURPOSE OF RESILIENCY PLANNING

The village of Amouli, American Samoa, is located on the southeast coast of Tutuila island, at the narrowest point of the island. It is located to the west of Au'asi village.

Amouli village, Tutuila Island in American Samoa



The village of Amouli is concerned about the impending impacts of climate change on their community. The community strives to achieve greater resiliency to these impacts through advanced planning and preparation. In 2009, a climate-related socioeconomic assessment was conducted by Dr. Supin Wongbusarakum[1] in the village of Amouli and Ofu in American Samoa. The preliminary report of the project indicated about 70% of household leaders in Amouli accepted the fact that global warming is occurring. Over 80% of them also believed that it will affect many sectors and resources within the village. The report showed key findings on how different socioeconomic groups have experienced various types of climate events and how they perceive their household vulnerability and capacity to cope with, recover from, and adjust to each.

In 2010, village leaders collaborated with a research team led by Dr. Arielle Levine[2] and Dr. Chip Fletcher[3] to increase village-level information regarding the specific impacts of climate change likely to affect their community. The research team collected detailed elevation data in Amouli village to create a digital elevation model of the coastal areas within the village. A time-table of sea-level-rise was applied to this model to demonstrate how the village would be affected by changes in sea-level over time. Digital models predicted coastal inundation in Amouli village under the current measured rate of sea-level-rise, as well as scenarios for a potential increase in the rate of sea-level-rise (both low and high range scenarios). Locally observed and predicted patterns were used (rather than global averages), and the modeled results were presented back to the community in video form during a community meeting held in July, 2011.

One foot of sea-level-rise by 2050 was used as the predicted guideline for planning purposes for Amouli village. This is considered a conservative estimate, as it is based on the low range scenario for projected sea-level-rise based on research by Vermeer and

[1] University of Hawaii, East-West Center
[2] San Diego State University, IMSG contractor to NOAA
[3] University of Hawaii Coastal Geology Group

Rahmstorf[4]. The most immediate effect of predicted sea-level-rise is beach erosion. Flooding upstream from tidal surges would result in increased stream mouth erosion. Increased sea level would also cause more occurrences of coastal inundation from storm surges, as well as potential failure of the protective sea wall along the village coast due to erosion.

Amouli model on coastal inundation (available in video format)

Climate change predictions for the Samoan archipelago also state that rains are likely to become less frequent, but more extreme in the future. This could cause drainage issues for Amouli village streams if rains occur in conjunction with higher tides. The water table will also increase with a rise in sea level, which means the ground will saturate faster and there will be an increase in flooding in the village. Salt water inundation and/or intrusion into the ground water is another potential problem, as is drought and bleaching of the coral reefs within Amouli's coastal area.

The village of Amouli identified that these predicted climate impacts may have significant implications on village livelihoods. Potential impacts to community health and safety through effects to the water supply, food security, pollutant outflows, transportation, and other lifelines were also identified. These issues, and how to effectively address them, were discussed during a village Participatory Learning Action (PLA) process (led by Fatima Sauafea-Le'au, NOAA PIRO) immediately following the presentation of the results of the NOAA/UH study.

[4] Vermeer, Martin and Stefan Rahmstorf. 2009. Global sea level linked to global temperature. PNAS. www.pnas.org/cgi/doi/10.1073/pnas.0907765106

PARTICIPATORY PROCESS FOR AMOULI RESILIENCY PLANNING

A Participatory Learning and Action (PLA) workshop was held with the village of Amouli on July 28th -29th, 2011 in Amouli village as the second part of the project. The purpose of the workshop was to ensure wider community participation and capacity building around the issue of climate change and to develop a community resiliency plan. PLA is a bottom-up approach that aids in gathering information using a diverse range of activities and tools to facilitate active participation of local people to strengthen their capacity to learn and act. Through this approach, the community learns about their own environment and is better able to identify local needs and subsequently implement appropriate strategies to meet those needs. In addition, the PLA approach provided the opportunity for the Amouli community to take ownership of the planning process, as well as to help build local accountability to implementing the responses and actions proposed in their village resiliency plan.

Amouli PLA workshop: Right – Small group exercise; Left – Group discussion

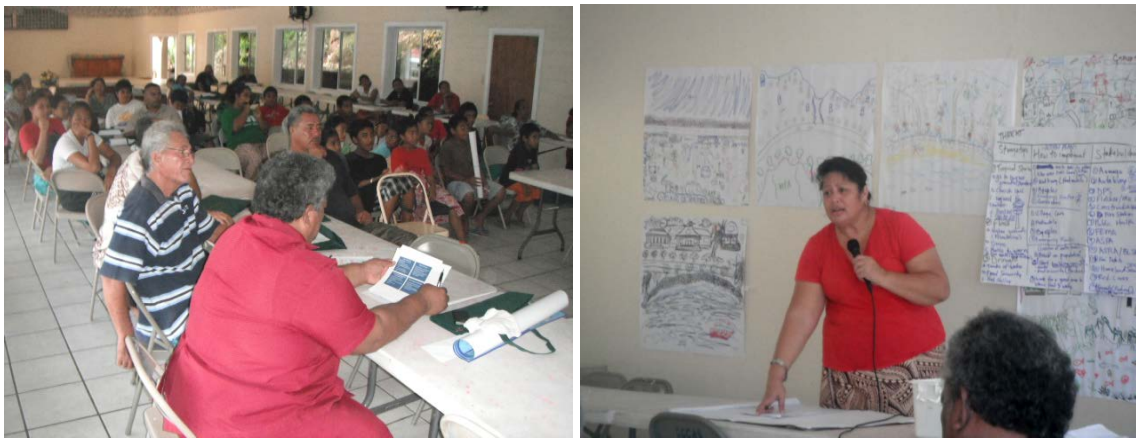
The following are the steps for the participatory approach using PLA tools and planning process for Amouli:

1. Initial Contact with Village Mayor
2. Meeting with village Mayor and Project Team
3. Coordinate PLA Community Climate Workshop with Village Mayor
4. Hold Workshop in the Village
5. Analyze results from workshop
6. Presentation of results back to the community
7. Select members for Village Planning Committee
8. Project Team works with Village Planning Committee in using workshop to formulate Village Resiliency Plan
9. Final draft Plan will review by key resource partners – English and Samoan versions
10. Presentation of Plan to Village Council

During the workshop, a Historical Profile was developed by the village participants to document the more significant climate related events that helped shape the village's past and future. The results of the historical profile were used in the planning meetings with the village resiliency planning committee to reflect and suggest possible responses and actions on potential climate related impacts to the community and its resources. The primary climate related events that were identified by participants in the workshop were tropical storms, flooding, drought, and landslides in combination with erosion. These events have been remembered and participants explained the impacts that these events had on their homes, roads, coasts and shoreline, farm lands and stream areas. Appendix A provides documentation of the Historical Profile developed by villagers during the workshop.

The outcomes of the PLA process are presented in the Amouli Village Climate Resiliency Plan section of this document.

Amouli planning committee in the development of the Village Resiliency Plan



Amouli PLA-Community Resilience towards Climate Change Workshop in 2011

AMOULI VILLAGE CLIMATE RESILIENCY RESPONSES AND ACTIONS

The village has identified in their resiliency plan three locally relevant potential climate change impacts and their implications for the village of Amouli. The information presented in the plan were collection of knowledge, recommendations and inputs from the village community through a community participatory workshop, planning meetings and individual interviews with key leaders. The village planning committee has prepared this plan for its village to better understand the potential climate change events and how to response and take actions to minimize any impacts due to those events. This is a three year plan and it acts as a guide to plan and prepare the village community towards impacts of Climate Change. The plan can be reviewed and revised by the village to better adapt their responses and actions to the changes within their village, environment and resources. In addition, the plan presents supporting partners that were identified through several planning committee meetings with government partners. Appendix B displays the support, assistance and contact information for some of the environment government partners.

Amouli Planning Committee with members of the AS-Jurisdiction Capacity Assessment Team from NOAA (photos by Glenn Page)

AMOULI CLIMATE RESILIENCY PLAN
2012-2015

Potential Climate Change Impact:

Tropical Storms – Under current predictions for climate change, the impact of tropical storms could be significant for Amouli village. Weather patterns are likely to become less predictable under various climate change scenarios, meaning that the village will need to be prepared for the unexpected. Predicted sea-level-rise could bring greater storm surges and increase the likelihood of storm-related flooding. Hurricanes and extreme rainfall events could become more intense, with greater wind-speeds and flooding damage.

Objective 1: By **2013**, three Emergency and Disaster Shelters are established and secured, with an Emergency Response Plan, to provide medical treatment, emergency responses and help to families and individuals during events of natural disasters. As a long-term vision, the community suggested the development of permanent emergency shelters to provide temporary housing, with improved supportive services for families, and to establish standards for these shelters.

Resiliency Responses and Actions:

- Village council designates three Emergency and Disaster Shelters within village
- Village council prepares Emergency Response Plan for the shelters
- Village council provides outreaches to families about designated Emergency and Disaster Shelters and Emergency Response Plan

Lead: Village Council	**Supporting Partners:** Homeland Security, Red Cross, Department of Public Safety, Department of Health, ASPA, Department of Public Works, Office of Samoan Affairs (OSA), Village (Youths, Church)

Objective 2: By **2012**, an Emergency and Disaster Response Team is established and well trained to provide aid to families and individuals during events of a natural disaster.

Resiliency Responses and Actions:

- Village council establishes an Emergency and Disaster Response Team of volunteers to assist in responding to emergency and disaster calls
- Determine the most effective training for volunteers to better respond and provide aid in an event of a natural disaster
- Facilitate Emergency and Response Training to volunteers quarterly by appropriate agencies

- Village council assigns rescue transportation vehicles for the three shelters

- Emergency and Disaster Response Team are well equipped with communication skills and tools to use in an event of an emergency or natural disaster

Lead: Village Council	**Supporting Partners:** Homeland Security, Red Cross, Department of Public Safety, Department of Health, ASPA, Department of Public Works, Office of Samoan Affairs, Emergency Medical Service, Marine Patrol, Swimming Association, Village (Youths, Church)

Objective 3: By **2013**, 50% of Amouli families practice emergency preparedness with adequate lifelines, needed supplies, and seasonal planting for emergency and disaster purposes

Resiliency Responses and Actions:

- Village mayor and planning committee work closely with appropriate agencies to plan, support and facilitate the implementation of an education and awareness campaign to village on Emergency and Response during natural disasters

- Village mayor conducts regular visits to families to remind and ensure their safety and develop preparations for an event of an emergency or natural disaster

- Village mayor and planning committee work with appropriate agencies to implement agriculture and tree planting training

- Village council and Emergency and Disaster Response Team conduct a check on each family when an approaching tropical storm or hurricane is confirmed

Lead: Village Mayor and Planning Committee	**Supporting Partners:** Homeland Security, Red Cross, Department of Public Safety, Department of Health, ASPA, Department of Public Works, Office of Samoan Affairs, Emergency Medical Service, Marine Patrol, CRAG, DMWR, NOAA-PIRO, ASCC Land-grant, Village (Youths, Church)

Potential Climate Change Impact:

Flooding – Approximately one foot of sea-level-rise is predicted for American Samoa by the year 2050. The primary effect of this increase in sea level is expected to be beach erosion which may worsen the effects of flooding, particularly if the sea wall fails. Flooding is predicted to occur up freshwater streams from increased tidal surges, and will exacerbate erosion at the mouth of streams. Inundation from storm surges will impact low-lying coastal

village areas. Rainfall events are also predicted to become more extreme. This may result in stream overflow, particularly if heavy rains coincide with higher tides, making it impossible for streams to drain. In addition, land slides from the mountains will cause impacts to low level areas especially on families and homes. The water table will also be higher due to sea-level-rise, meaning the ground will saturate more quickly and cause rain-related flooding to occur more frequently.

Objective 1: By **2012**, 80% of families near streams and coastal areas are greatly aware of the impacts caused by flooding and are well prepared for the effects of the impacts

Resiliency Responses and Actions:

- Village mayor and planning committee work collaboratively with appropriate agencies to conduct awareness and education campaigns in village on impacts of flooding and other natural disasters

- Village mayor and planning committee conducts visits to families near streams and coastal areas to assess the potential impacts of flooding and other natural disasters that could affect their homes and lives

- Village mayor work collaboratively with appropriate agencies to assess the number of families live near streams and coastal areas to conduct a pre and post monitoring in an event of flooding

- Village mayor work closely with appropriate agencies to determine and discuss potential impacts from flooding and other natural related events to inform village on possible negative effects

Lead: Village Mayor and Planning Committee	**Supporting Partners:** Homeland Security, Red Cross, Department of Public Safety, Department of Health, ASPA, Department of Public Works, Office of Samoan Affairs, Emergency Medical Service, Marine Patrol, CRAG, DMWR, NOAA-PIRO, AS-EPA, ASCC Land-grant, USDA NRCS, Village (Youths, Church)

Objective 2: By **2012**, Amouli worked collaboratively with ASCC Land grant and USDA NRCS in actively planting trees on identified unstable stream banks and coastal areas.

Resiliency Responses and Actions:

- Village mayor collaborates with appropriate agencies to identify priority areas that needs to be stabilized through tree planting

- Provide education and awareness on the importance of tree planting to reduce impacts

from flooding

- Implement tree planting with engagement of the youth groups and families live nearby streams and coastal areas

Lead: Village Mayor	**Supporting Partners:** ASCC Land grant Program, USDA NRCS, DMWR, AS-EPA, DOC, CRAG, Department of Public Works, NOAA-PIRO, Office of Samoan Affairs, Village (Youths, Church)

Potential Climate Change Impact:

Drought – Increasing temperatures due to climate change may cause increased incidences of drought. The nature of rainfall may change so that rain patterns are less frequent or regular, but rain episodes are extreme, meaning the rainfall may not effectively provide for village needs.

Objective 1: By **2013**, Village spring water sources are mapped, well managed, cleaned and maintained by the village council to secure clean drinking water for the community

Resiliency Responses and Actions:

- Village mayor collaborates with the appropriate agencies to identify all spring water sources within the village and utilize GIS techniques to develop a map of these sources
- Village mayor collaborates with the appropriate agencies to determine the existing, active and reliable sources of spring water to apply management and maintenance work
- AS-EPA conducts water testing in the active spring water sources to determine any contamination
- Village council strongly enforces regular clean-up at the spring water sources
- Village mayor and *aumaga* (untitled men) conducts regular clean-up and maintenance work to keep the spring water sources clean and safe for the community

Lead: Village Council	**Supporting Partners:** ASCC Land grant Program, USDA NRCS, DMWR, AS-EPA, DOC, CRAG, Department of Public Works, NOAA-PIRO, Office of Samoan Affairs, Village (Youths, Church)

Objective 2: By **2013**, agriculture and aquaculture are well established and maintained by the village

Resiliency Responses and Actions:

- Village mayor collaborates with appropriate agencies in planning and implementing trainings on agriculture and aquaculture or in a combination such as in aquaponics - Village mayor and appropriate agencies work closely with the youth groups to engage them in agriculture and/or aquaculture projects - Village mayor works with appropriate agencies to conduct seasonal planting and farming training and workshops	
Lead: Village mayor	**Supporting Partners:** ASCC Land grant Program, USDA NRCS, DMWR, AS-EPA, DOC, CRAG, Department of Public Works, NOAA-PIRO, Office of Samoan Affairs, Village (Youths, Church)
Objective 3: By **2013**, a Marine Protected Area is established with a management plan that includes climate change impacts to coral reefs and reef resilience	
Resiliency Responses and Actions: - Village mayor works collaboratively with the appropriate agencies in establishing a MPA within the village reefs - Facilitate awareness and education campaign on coral reefs, climate change impacts, reef resilience, fisheries and marine environment to youth groups - Village council supports and collaborates with appropriate agencies in developing a management plan for its MPA - Village mayor works collaboratively with the appropriate agencies to plan and organize a reef resilience training at the village level to youth groups - Village youths will work closely with government agencies to conduct marine debris and coastal clean up in the reef area and beaches	
Lead: Village Mayor	**Supporting Partners:** DMWR, CRAG, Le Tausagi, AS-EPA, NOAA-PIRO, ASCC, DOC, DPS, Village (Youths, Church)

VILLAGE RESILIENCY PLANNING COMMITTEE

NAME	ROLE	CONTACT NUMBER
Elder Rev. Leatulagi	Leader or Co-leader	622-7094
Senator HC Fuata	Leader or Co-leader	256-1172
Keresoma Tauese	Member	770-0015
Tiatele Sanele Siloi	Village Mayor and Liaison	731-9366
Esekielu T. Foleni	Member	252-4394
Voli Savea	Member	622-7675
Pasa Turituri	Member and Liaison	252-1265
Etueni Tyrell	Member	731-2572
Vaimili Tyrell	Member	731-0790

REFERENCES

Andrew Crane Droesch, Nickey/Gaseb, Paradeep Kurukulasuriya, Andre Mershon, Katiella Mai Moussa, Dale Rankine, Alejandro Santos, 2008. A Guide to the Vulnerability Reduction Assessment. UNDP Working Paper.

Sauafea-Le'au, Fatima, 2009. Participatory, Learning, and Action (PLA)-Resource Guide for Practitioners, American Samoa context.

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Appendix A

Historical Profile of Climate-related Events in Amouli village
PLA Workshop 2011

Events/Threats	Impacts to Village				
	1960-1970	1971-1980	1981-1990	1991-2000	2001-Present
Tropical Storm and Surge	- Damaged to road, coastal areas and farm lands - Hurricane 1966 had done most damaged to village homes, roads, farms and coastal areas	- Damaged to road, coastal areas and farm lands - More impacts at areas next to the public health site	- Damaged to road, coastal areas and farm lands - More impacts at areas next to the public health site	- Damaged to road, coastal areas and farm lands - More impacts at areas next to the public health site - Early 90s tropical storms impacted some homes and roads	- Damaged to road, coastal areas and farm lands - More impacts at areas next to the public health site
Flooding	- In 1966, streams flooded and shorelines impacted - Homes were damaged as well as farm lands	- Some flooding in the streams that damaged homes nearby	- Some flooding in the streams that damaged homes nearby - More impacts at areas next to the public health site	- A lot of homes, roads and shoreline damaged from tropical storms in the early 90s - More impacts at areas next to the public health site	- More flooding occurred in streams affecting homes nearby and coastal areas
Drought	- less land and coastal resources for the village	- None	- less land and coastal resources for the village	None	None
Landslide/Erosion	- Due to flooding and heavy rainfall during the tropical storm seasons, areas nearby streams and coastal areas eroded	- None	None	- The early 90s tropical storms resulted in landslide behind EFKAS church hall and heavy stream soil erosion -beach erosion and stream/land erosion	- Some landslide behind the EFKAS church hall - Soli erosion from land, streams and beach erosion resulted from heavy rain and flooding

Appendix B

SUPPORTING ENVIRONMENT PARTNERS CONTACT INFORMATION

Agency/Partner	Resources & Support	Contact(s)
ASCC Land Grant – Forestry – UH Sea Grant ***Phone #: 699-1394***	• Offer Forestry outreach program • Coordinate & conduct tree planting of native species as part of reforestation & restoration • Offer training at the Forestry Greenhouse on ways to better maintain plants on propagation & transplanting of tree species • Provide training & information on hydroponics & aquaculture	Amio Mavaega Marcella Talatau Tony Maugalei Pepe Misa Ephraim Temple Francis Leiato
Coral Reef Advisory Group (CRAG) ***Phone #: 633-5155***	• Outreach • Potential funding for marine resource management • Organized clean ups • Media outlets • Education materials (Climate Change / MPA) • Plastic Bag Reduction campaign materials	Kristine Bucchianeri Carolyn Doherty Trevor Kaitu'u
Department of Commerce – Coastal Management Program (DOC-CZMP) ***Phone #: 633-5155***	• Training village on environmental regulations • Community village layout for resource management (GIS based) • Building environmental leadership for youth • Wetland & signage/ walks • Development of educational signage on species • Best practices for building/ development • Establishment of a special management area • Education & Outreach • Recycling station at church o Glass – Sand, Cans - $$	Solialofi Tuaumu Sandra Lutu

Department of Marine & Wildlife Resources (DMWR)
 	
Phone #: 633-4456
	• Information Education Division
	  o Educational Outreach
	  o Fishing Clinics (youth groups)
	• Wildlife Division
	  o Monitoring Species (lizards)
	  o Birds & Bats (habitat)
	  o Mangroves in Wetlands
	  o Wildlife Habitat Mapping
	  o Native Habitats Program
	• MPA Programs
	  o Education & Outreach
	  o Advertisement of regulations
	  o Opportunity to develop new projects with Government
	  o Monitoring fish, corals, invertebrates
	  o Community Workshops
		Maria Vaofanua
		Tafito Aitaoto
		Selaina V. Tuimavave
		Domingo Ochavillo
		Peter Eves

	o Clean Ups • Enforcement o Education Outreach on rules & regulations that DMWR enforce o Enforce rules & regs on hunting of Doves & Bats	
Environment Protection Agency (AS-EPA) **Phone #: 633-2304**	• Laboratory Water Quality o Sampling & Testing (streams / tap water/ ocean/) • Enforcement & Compliance o Piggeries o Solid Waste o Oil spill o Pesticides o Plastic bags o Vehicle importation • Outreach & Education o Science Fair projects assistance o Research	Christianera Tuitele Tumau Lokeni
Fagatele Bay National Marine Sanctuary (FBNMS) ***Phone #: 633-5155***	• Outreach & Education • Enviro-Discoveries activities in collaboration with other resource partners • Village outreaches • Research and monitoring of coral reefs in Fagatele bay and marine mammals	Veronika Mortenson
National Park Service (NPS) **Phone #: 633-7082**	• Outreach & Education • Removal of invasive species in National Park • Marine monitoring within National Park	Michael Larson Dr. Tim Clark
NOAA Fisheries-PIRO – Field Office ***Phone #: 633-5326***	• Provide coordination with & assistance to local management community in coral reef management through the national coral reef conservation program (CRCP) • Coral Reef Local Action Strategies development & project planning • Provide assistance & support to MPA programs • Coordinate planning & support with resource partners & villages for watershed management projects • Coordinate planning & support for Reef Resilience & Community Resilience projects • Socioeconomic assessments of coastal areas • Coordinate with other NOAA partners eg. CRED & local partners on monitoring & reef assessments • Review projects that may have adverse effects on Essential Fish Habitat (EFH) • Outreach & Education campaigns	Fatima Sauafea-Le'au

	• Seek & obtain available funds & resources to support management efforts through Coral Program & NOAA	
USDA Natural Resources Conservation Service – Pago Pago Office **Phone #: 633-1031 Ext. 122**	• Provide technical assistance to farmers to improve productivity of their farms as well as reduce soil erosion • Provide cost-sharing assistance for eligible farmers to improve productivity and reduce soli erosion • Provide technical assistance for stream bank stabilization projects as well as riparian vegetation practices • Offers educational outreach	Nicholas Saumweber